“PUBLIC EXPENDITURE IN INFRASTRUCTURE AND IT’S IMPACT ON INDIA’S ECONOMIC GROWTH”

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Introduction:

The term Infrastructure first appeared in the late 1880s, derived from French, with *infra-* meaning below and *structure* meaning building. The word was first used in the late 1800s to describe the foundation or substructure of a building, railroad, or road. The word Infrastructure become popular in English after 2nd World War. The word Infrastructure also referred to the physical and institutional systems that support society. Infrastructure development is the process of creating and improving the physical and organizational structures that support a country's economy and citizens' quality of life. Simply the Infrastructure sector includes Roads, Railways, Ports, Transportation Logistic, Electricity, Telecommunications, Irrigation, Water supply, sanitization, Airports, Wearhouse facilities, Oil and gas pipeline industries, etc. That means the major sector that propels overall development of the Indian economy. Infrastructure can mean the foundation upon which the structure of economy is built. Public infrastructure refers to infrastructure facilities, systems, and structures that are developed, owned, and operated by the government. Sometimes infrastructure development is operated and owned by private companies / firms. It includes all infrastructure facilities that are open to the general public for use. India is one of the fastest developing country in world. India's infrastructure is a major sector that drives the country's economic development. Indian Government is taking big steps to improve the infrastructure. Also, Indian Government is giving most of the budget allocation to Infrastructure sector. Infrastructure is understood as an important input for industrial and overall economic development. Infrastructure development is crucial to achieve the India 2047 vision for a $ 40 trillion economy and be reclassified from a developing economy to a developed economy. The Public expenditure on Infrastructure is raising in some recent years, as government is adapting new policies for Infrastructure development. For development in Infrastructure central government is providing long-term interest-free loans to

the states to assist in resource allocation. Capital investment in infrastructure has a significant long-term economic impact on employment generation and job creation.

Many times, the infrastructure development involves government / public and private investment. Public-Private Partnerships (PPP) is collaboration of a government agency and a private-sector company that can be used Finance, Build, Invest & for doing Infrastructure development projects like Public Transport network, establishing new company, building new roads, etc. Financing projects through public-private partnership can help to give employment opportunities in private sector, also private company grows, government revenue increase & projects take less time to complete.

Indian Infrastructure has significant growth in and advancement in last 10 years. With the Expansion in National Highway by 1.6 times, Electrification of 94% of the rail network, operationalization of 100 high-speed Vande Bharat trains, modernization of 1,318 railway stations, expansion of metro rail network by ~4 times whilst serving 21 cities, operationalization of 84 Airports and increase in Power generation capacity by 70%. This Infrastructure development has accelerated by government new programmes and policy with help of new technology. Like National Infrastructure Pipeline (NIP) worth of 111 crore, National Monetization Pipeline (NMP) project worth 6 lakh crore and PM **GatiShakti** National Master Plan. Also, center government is doing Sector-focused large scale national level programs like Bharatmala, Sagarmala, Regional Connectivity Scheme-UDAN, Dedicated Freight Corridors, High Speed Rail network, Redevelopment of Railway Stations, BharatNet, Jal Jeevan Mission, AMRUT, Smart Cities Mission, etc. Also state governments have realized the importance of infrastructure for faster economic growth in India and have collectively expanded their capital outlays to Rs 8.7 lakh crore in 2024, marking an increase of 2.5 times since 2015. Also, the Centre government of India is giving state interest-free loans to the states for the infrastructure development and growth. Under the special assistance scheme, provisions of more than Rs 1 lakh cr. have been made in the last two years and this year also Rs 1.5 lakh crore have been allocated to support states in their resource allocation. The Centre government is giving special emphasis on development of economically weaker states like Bihar, Jharkhand, West Bengal, Odisha, and Andhra Pradesh. The infrastructure initiatives across the states will include

development of industrial nodes, airports, medical colleges, Roads, Briges, Building Public companies, Railroads, and sports infrastructure.

Examples of Infrastructure:

1) **Transportation infrastructure**: Bridges, roads, airports, rail transport, Tunnels, Train stations, etc.
2) **Water infrastructure** – Water supply, water resource management, flood management, proper sewage and drainage systems, coastal restoration infrastructure, canals
3) **Power and energy infrastructure** – Power grid, power stations, wind turbines, gas pipelines, solar panels, etc.
4) **Telecommunications infrastructure** – Telephone network, broadband network, Wi-Fi services, etc.
5) **Political infrastructure** – Governmental institutions such as courts of law, regulatory bodies, etc.; Public security services such as the police force, defense, etc.
6) **Educational infrastructure** – Public schools and universities, public training institutes, Playground, clean drinking water, school stationery and other equipment, etc.
7) **Health infrastructure** – Public hospitals, subsidized health clinics, Drugs and Medicines, etc.
8) **Recreational infrastructure** – Public parks and gardens, beaches, historical sites, natural reserves, etc.

Above all are examples of infrastructure that is provided by government and also by private sector. Sometimes the government gives contracts and funds to private people, by doing projects through Public-Private Partnership (PPP) both Public and private Infrastructure sector grows simultaneously.

There are three types of Infrastructure:

1) **Soft Infrastructure**: Soft infrastructure refers to the institutions and human capital required to keep an economy running and provide services to the population like Government offices, financial institutions, Healthcare, Law enforcement, Education, Civic agencies, Specialized buildings, Equipment, Regulations governing systems, and Communication.
2) **Hard Infrastructure**: Government offices, financial institutions, Healthcare, Law enforcement, Education, Civic agencies, Specialized buildings, Equipment, Regulations governing systems, and Communication.
3) **Critical Infrastructure**: Critical infrastructure makes up all the assets that are defined by the government as being crucial to the functioning of an economy. It includes assets used for shelter and heating, telecommunication, public health, agricultural facilities, etc. Examples of such assets: natural gas, drinking water, medicine.

Growth of Infrastructure development in India:

The Government of India has embarked on an ambitious journey to revolutionize the country's infrastructure landscape, aiming to bolster economic growth, enhance connectivity, and improve the quality of life for its citizens. In the budget proposal for 2024-2025, Finance Minister Nirmala Sitaraman has set aside 11 lakh crores for Capital Expenditure, comprising 3.4% of the GDP. With the aim to push States to spend on infrastructure, she said ₹1.5 lakh crore was being made available to them in the form of long-term interest free loans. The government has sustained its expenditure as a share of the total Budget on infrastructure which was at 13.9% (as compared to 14.3% in FY2024 RE). The Indian government has launched several Policies & Programs for modernizing transportation networks, upgrading urban amenities, and expanding digital infrastructure. India has achieved significant milestones in infrastructure development, including the inauguration of the world's longest highway tunnel, the **Atal Tunnel**, and the construction of the world's highest railway bridge, the **Chenab Bridge**. Additionally, India has set records by unveiling iconic landmarks like the **Statue of Unity** – the world’s tallest statue and embarked on transformative projects like the **Zojila Tunnel**, Asia’s longest tunnel, for allweather connectivity in Ladakh.

According to the National Institute of Public Finance and Policy very rupee spent on infrastructure results in gain of 2.5 to 3.5 rupees in GDP. So, we can say that infrastructure has a significant influence on productivity of all sectors like agriculture, manufacturing, services, and tourism, etc. The India's Road network has grown 59%. India has the second longest road network in the world, at about 63.32 lakh km (2022-23). The National Highways Authority of India (NHAI) has significantly increased its capital expenditure over the past five years, reflecting the government's commitment in enhancing the national highways network and infrastructure. The national Highways in the county has grown from about 91,287 km in March 2014 to about 1,46,126 km, as on July 25, 2024. In last 5 years, National Highways Authority of India, has constructed 24,050 km of National Highways with estimated 45 Crore man days of direct employment, 57 Crore man days of indirect employment and 532 Crore man days of induced employment. The substantial job creation shows the socio-economic benefit of infrastructure. In the era of technology Indian Railways recognizes the need to modernize its infrastructure. Government of India has built and introduced Semi-High-Speed Vande Bharat Trains, Vistadome Coaches, Introduce Tejas Rajdhani Trains, New Amrit Bharat Trains, HighSpeed Rail Projects, Connectivity and Network Expansion, etc. In 2022-23, Indian railways earned 69% of its internal revenue from freight and 24% from passenger traffic. The remaining 7% was earned from other miscellaneous sources such as parcel service, coaching receipts, and sale of platform tickets. In 2023, Indian Railways' revenue was around 2.4 trillion Indian rupees. Additionally, in 2023-24, Indian Railways reported all-time high total receipts of ₹2,56,093 crores and generated a Net Revenue of ₹3,260 crore. Indias healthcare infrastructure has grown tremendously after the pandemic. The Indian Healthcare industry continued its healthy growth in 2023 and reached a value of US$ 372 billion driven by both the private sector. In 2024 India's healthcare sector has largest employment and employ a total of 7.5 million people. In 2022-23, India's public healthcare expenditure was 2.1% of GDP. India's healthcare sector employs 4.71 million people, with around 0.5 million being added annually. India's healthcare system is one of the largest in world healthcare, it expected to grow 50 Billion $ by 2033. India has emerged as a hub for innovation, research and development due to its relatively low cost of clinical research. Indian government has launched many health care schemes like the National Health Policy and Ayushman Bharat, Pradhan Mantri Jan Arogya Yojana. The Interim Budget 2024-25 emphasizes healthcare infrastructure by increasing the allocation for the Pradhan Mantri Ayushman Bharat

Health Infrastructure Mission (PMABHIM) from Rs. 2,100 crore (US$ 251 million) to Rs. 4,108 crore (US$ 492 million).

Review of Literature:

The infrastructure sector is a key driver of the Indian economy. The sector is highly responsible for propelling India's overall development and enjoys intense focus from the Government for initiating policies that would ensure the time-bound creation of world-class infrastructure in the country. The infrastructure is very important for countries growth & development. The following literature review is related to research done on India's Infrastructure development. So far, a lot of research studies have been done on infrastructure in India. But their world / population was limited only to the district or region. But my population will be whole country / India. Also, my research objectives are different. In my research first I will study the government expenditure on Infrastructure and development then it's impact on India's economic development. The following research reviews are relevant to my study research topic and have been taken from various journals. Also, I have taken reviews from shodgoangotri.

1) "Economic Development in India: The Role of Individual Enterprise" (And Entrepreneurial Spirit), Asia-Pacific Development Journal, Vol. 12, No. 2. (2005) Author - Anil K. Lal and Ronald W. Clement.

Outline India's economic development strategy immediately after Independence was based primarily on the Mahalanobis model, the Mahalanobis model placed strong emphasis on mining and manufacturing (for the production of capital goods) and infrastructural development (including electricity generation and transportation). Over time, India created a large number of government institutions to meet the objective of growth with equity - Economic Development In India: The Role Of Individual Enterprise (And Entrepreneurial Spirit), Asia-Pacific Development Journal.

2) "Sustainability of the Indian Railways Turnaround: A Stage Theory Perspective" - The International Workshop on Innovation and Entrepreneurship held at Cankaya University, Ankara, Turkey (2007) Author - Anand K Sharma & Mathew J Manimala.

Outline that there was external as well as internal causes for the declining performance of Indian Railways. The budgetary support from the Central Government was dwindling and its financial situation did not allow higher budgetary support to the Ministry of Railways, besides the competition from road and air was increasing - Sustainability of The Indian Railways Turnaround: A Stage Theory Perspective - The International Workshop on Innovation and Entrepreneurship held at Cankaya University, Ankara, Turkey.

3) "Private financing of infrastructure in India: outlook and prospects." International Journal of Marketing, Financial Services & Management Research, Volume 1, Number 3, ISSN 2277 3622. (2012) , Author – Hemlata Sharma.

The author has studied the characteristics of infrastructure, reasons why private sector participation is needed and sources of finance from private sector. She concludes that Private sector participation in infrastructure is necessary as it not only ensures a larger flow of resources but also introduces greater efficiency in the supply of infrastructure. This is because privately implemented and managed projects are likely to have a better record of delivering services which are cheaper and of a higher quality.

4) "Emerging trends in Infrastructure development in India." Indian journal of Applied Research, Volume 3 Issue 4, ISSN 2249-555X. (2013) Author - Syed Mohd Ali Taqv.

Tried to study importance of infrastructure in India, infrastructure financing, need for infrastructure investment, trends in infrastructure development in India.

5) "Current infrastructure scenario and rise in construction and allied industries in India", International Journal of Science, Engineering and Technology Research , Volume 2, Issue 8,

ISSN 2278 – 7798. (2013) Author -Rai. Shweta and Ghavate Prateek. Had studied impact of infrastructure on various sectors. Researcher states that Infrastructure growth is a stepping stone of a stable and productive society, it not only presents unique challenges but also brings opportunities for private and public sectors in the field of construction.

6) Article – "Infrastructure Development and FDI Inflow to Developing Economies: Evidence from India" (05/2016), Author – Manpreet Kaur, Apalak Khatua, Surendra S. Yadav.

Nowadays, developing economies are becoming the preferred destination of foreign direct investment (FDI) inflow. We draw insights from Dunning's eclectic paradigm to explore how FDI inflow is influenced by the quality of the physical infrastructure and human resources of the host country. We investigate various India-specific infrastructural factors affecting FDI inflow between 1991 and 2010. Our empirical findings indicate that factors like railway transportation and road network as well as the quality of human resources played a crucial role in attracting FDI. However, air transportation or communication infrastructure is yet to play a significant role. Our study makes a modest attempt to identify areas of concern and scope for the further improvement of India's infrastructure facilities to attract foreign investment in the future.

7) Article – "Infrastructure and Development in Rural India" (28/08/2017), Author – Madhusudan Ghosh.

This article evaluates rural infrastructure facilities in 16 major states of India, and examines their impacts on some income and non-income dimensions of rural development. Despite several public initiatives for infrastructure development in rural India, facilities continue to be poor, and progress has been mostly unsatisfactory with differential performance across states. Estimates of regression coefficients of the composite indices and individual indicators of rural infrastructure reveal that improved physical and social infrastructure and livelihood opportunities enhance agricultural productivity and output, improve literacy and life expectancy, and reduce poverty and infant mortality. The results, showing the relative importance of various

infrastructures, suggest that the government should prioritise additional investments in electricity, roads, irrigation, housing and telecommunications to enhance overall well-being.

8) Article – "Road Transport Infrastructure and Economic Growth in India" (10/10/2018), Author - Shruti Tripathi & Vikash Gautham.

Creation of road transport infrastructure, through its direct and indirect effects, has a bearing on sustainability of growth and overall development of a country. It provides knowledge spillovers resulting from the whole agglomerated area via network dynamic externalities. The models based on cost or production function that incorporate infrastructure but simply assume a positive effect are no longer satisfactory to take to the data, because they ignore any feedback effect. In this article, therefore, we have twin objectives: first, we examine whether road transport infrastructure has a long-run equilibrium relationship with the macroeconomic variables such as output, employment and gross private capital formation or not. Second, we use vector autoregression (VAR) approach to analyze the impact of road transport infrastructure on macroeconomic variables. The elasticities that are estimated in the VAR model differ from the production function elasticities, as they incorporate feedback effect between the variables in the model, as opposed to the 'ceteris paribus' elasticities which are estimated in production function studies.

9) Article – "A methodological framework to address gaps in the evidence on infrastructure impacts: the case of an Indian railway project evaluation" (16/12/2018), Author – Sreeja Jaiswal & Gunther Bensch.

Infrastructure is a key area of public investment and development cooperation, and can be seen as a critical enabler of trade and integration. Stakeholders increasingly demand evidence on the effectiveness of investments in infrastructure such as railways, in part because these investments typically lock in development patterns for decades. In this article we take stock of the main findings, methodological approaches, gaps and caveats of the current literature with a focus on railways. Based on this analysis, we present a methodology for an impact evaluation

framework which builds on existing knowledge and addresses some of these shortcomings. Beyond the dearth of empirical evidence on the socio-economic and environmental impacts of infrastructure, we discuss critiques of the currently prevalent methodological toolbox. Using a real-world railway project in India, the Konkan Railway, we exemplify how a rigorous quantitative impact assessment can integrate inter-disciplinary and mixed-methods features to address these issues. Specifically, we apply different quasi-experimental techniques on the level of intermediate and ultimate outcome and impact indicators, using census, survey and satellite data and information from document analyses, interviews and focus group discussions. We draw on insights from economics, sociology, engineering and geography in making sense of large infrastructure projects and their impacts.

10) Article – "Review of Infrastructure Development and Its Financing in India" (April 2020), Author - Reena Agrawal, Jaipuria Institute of Management.

Infrastructure is one of the most crucial pillars of productivity in any economy. Pushing infrastructure development and particularly organizing funds for infrastructure projects have been the biggest challenge in developing nations. The present study was taken up to review the infrastructure development and its financing in India. The study intended to (1) study the infrastructure development in India in the 11th and 12th Five Year Plan, (2) examine the sources used for infrastructure financing in India, (3) assess the actions taken by government to facilitate infrastructure financing and (4) propose measures to augment infrastructure financing to overcome infrastructure deficit in the country. It was found that though Government of India and Reserve Bank of India have taken several initiatives to facilitate infrastructure financing, there still exists a vast gap between supply **side** and the demand side. Some of the recommendations given in the paper include the need to evolve innovative business models and mitigate administrative glitches to ensure larger private participation; exploit the untapped potential of diaspora; revisit the statutory liquidity ratio norms for banks; evolve the municipal bond market; boost regional integration and improved connectivity through creation of corridors between subcontinental regions, which would not only bridge the finance gap but also the knowledge gap, etc.

11) Article – "Infrastructure development in India: a systematic review", Author – A Indira (Centre for Budget and Policy Studies), Chandrasekaran Nagarajan (Loyola Collage).

It is now well-accepted that infrastructure development is essential for the growth of any economy. Successive governments in India, both at the Union and State level have given a thrust towards increased budgetary spending on infrastructure to help economic growth. On the eve of the 75th year of independence, there is a reiteration for longterm initiatives, including focused programs for roads, railways, airports, waterways, mass transport, ports, and logistics to further boost infrastructure spending. Keeping this in mind, the authors sought to systematically review the literature on how infrastructure development has unfolded in India between the years 2000–2022. The study shows that with diverse economic growth in India, there is interest in infrastructure development aligned with public interests. Infrastructure development is contextual and location specific. Access to infrastructure positively impacts social and economic outcomes. There is however growing concern for sustainable development with rapid urbanization.

12) Article- "Infrastructure Development in India: The Way Ahead" (23/05/2022), Author - Shalu Saini & Narayan Giri.

Infrastructure development is prerequisite in transforming a slow-moving economy into an advanced one. In the Global Competitiveness Index, India's rank is 70 out of 140 countries for infrastructure quality in the world. As per the recent estimation, to convert the vision of $5 trillion economy into reality, $4.51 trillion needs to be invested by 2030 in building the infrastructure of the country. Great efforts in the form of huge investment in infrastructure is required if we want to convert this dream into reality. The latest Budgetary outlay of Government of India for infrastructure sector of ₹100 lakh crore which is streamlined to be invested on infrastructure over the next 5 years and more than 6,500 projects will boost the economic development of the country. Infrastructure industry encompasses sectors such as social and commercial infrastructure, communication, energy, transport and water sanitation.

This article is an attempt to study the public private partnership (PPP) model in infrastructural development in India. This research article has six sections as follows. Section 1 aims at defining the importance of infrastructure for economic growth of the country. Section 2 provides the discussion on PPP model. Section 3 explains the review of literature. Section 4 represents the research problem and research question followed by discussion and possible solutions in Section 5 and, finally, Section 6 of the article represents the conclusions and the limitations along with the direction for future research.

Need of the study:

Studying the Indian Infrastructure development is very important point. Because when government invests in infrastructure then country grows economically and socially. Infrastructure expenditure / Invest led to employment generation. There are so many sectors of Infrastructure that are not studies / less studies. I will study the expenditure on various sectors of infrastructure in India & the resulting economic growth in India using research statistical tools & techniques. Many researchers have done research in Infrastructure, but they have taken the states, region or district as population. But my population is whole India. Is there economic growth in the infrastructure sector where the government is spending & what is the impact of that economic growth on India? In some recent years government has launched the programmes in several infrastructure sectors like National Infrastructure Pipeline (NIP), PM Gati Shakti National Master Plan (NMP), Sagarmala Project, Ude Desh Ka Aam Nagrik (UDAN), Mumbai Coastal Road, Atal Tunnel, Adani copper plant, Adani solar project, etc. These also need to be studied. What effect did all these policies & Programs have on India's economic development of the various infrastructure? Many times, the government invests with private companies in serval sectors that's called Public-Private Partnership (PPP) investment. How does (PPP)'s investment / expenditure on infrastructure affects the Indian economy. So, I will be finding out the public expenditure on infrastructure and it's impact of growth in Indian economy.

Objectives:

1) To study the government policies and programmes for infrastructure development.

2**)** Impact of public expenditure on infrastructure development in serval sectors like railway & bridges, road & transport, energy, telecommunications.

3) To study the acceleration of infrastructure development through public-private partnership.

4) To examine the impact of public expenditure on Infrastructure on employment generation.

Hypothesis:

1) The effectiveness of government Policies & Programmes had a significant impact on the infrastructure development and economic growth in India.

2) Public-Private Partnership (PPP) accelerate more effectively than government spending.

3) India's unemployment rate is falling due to the public expenditure on infrastructure.

Research Methodology:

In research, research methodology plays a very important role. It allows us to critically evaluate a study's overall validity and reliability. In this research I will explore and analyze the Infrastructre development and it's impact of economic growth on India.

I. **Data collection:** In this research I have taken only secondary data. The data has collected both qualitative and quantitative types. Secondary data sources are Government official websites, Journals, Articles, Published research Papers, Newspapers, Online websites, etc.

II. **Research design:** The research design has both descriptive & Numerical methods. For doing research I have used different analytical methods & various statistical tools.

III. **Research area:** The research area will be whole India because I will be studying whole Indian infrastructure sector development and its growth.

IV. **Data Analysis:** This study shows the India's public infrastructure development in various sectors & it's impact on India's growth and development. I have used tables, figures, numerical data that will be used for enhancing the clarification and presentation of facts and results**.** The present study will use various statistical tests. Example χ 2 test (pronounced as chi-square test) is one of the simplest and most widely used nonparametric tests in statistical work, average, standard deviation, coefficient of variance, T-test & F-test.

V. **Limitation:** Duration of the data collection will be from 2000 to 2024.

WORK PLAN:

CHAPTER I: Introduction –

The first chapter deals with overview of Indian infrastructure expenditure, development & it's impact on Indian economy. Along with that, what is infrastructure, its definition, its scope. How India's Infrastructure and it's various sectors have developed & it's impact on India's economy.

CHAPTER II: Literature Review –

The second chapter is concerned with all the review related to infrastructure development in various sectors. I will take the reviews those who studied the India's infrastructure development.

CHAPTER III: Research Methodology –

This chapter includes statement of the problem, scope, hypothesis, research design, limitations, & chapter scheme of the study.

CHAPTER IV: Objectives –

In this chapter I will study the objective & analysis them.

CHAPTER V: Data analysis and Interpretation -

This chapter will cover presentation of collected data in classified and tabular form along with analysis by using suitable statistical software.

CHAPTER VI: Findings / Conclusions and Suggestions –

This will be the last chapter of my research. After the analysis of the data will be completed, the findings will be written in it. And along with it the necessary advice will be given to the government.

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Appendices

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13) Article - Infrastructure Development and FDI Inflow to Developing Economies: Evidence from India (05/2016), Author – Manpreet Kaur, Apalak Khatua, Surendra S. Yadav.

14) Article - Infrastructure and Development in Rural India (28/08/2017), Author – Madhusudan Ghosh

15) Article - A methodological framework to address gaps in the evidence on infrastructure impacts: the case of an Indian railway project evaluation (16/12/2018), Author – Sreeja Jaiswal & Gunther Bensch.

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